AC Power
For *Business-Critical Continuity™*

Liebert® MPX™

User Manual—Global Applications

EMERSON
Network Power

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SAVE THESE INSTRUCTIONS

This manual contains important safety instructions. Read all safety, installation and operating instructions before installing a Liebert MPX. Adhere to all warnings on the unit and in this manual. Follow all operating and user instructions.

- The Liebert MPX is designed to deliver power to information technology and telecommunication equipment. The Liebert MPX is not intended for use with life support or other designated critical devices. If uncertain about its application, consult your local dealer or your Emerson representative.
- Maximum electrical load must not exceed that shown on the Liebert MPX module rating labels.
- Operate the Liebert MPX in an indoor environment only within an ambient temperature range of 41°F to 131°F (5°C to 55°C) with a relative humidity of 0% ~ 95%, non-condensing. Install it in a clean environment, free of conductive contaminants, moisture, flammable liquids, gases and corrosive substances.
- Do not continue to use the Liebert MPX if the LED panel or monitoring interface indicators are not in accordance with these operating instructions (see **5.0 - Operation and Configuration**). Refer all faults to your local dealer, Emerson representative or Emerson Distributed Processing Applications Engineering.
- Never insert any foreign object into a Liebert MPX.
- Do not connect equipment that could overload the Liebert MPX.
- Refer to **6.0 - Specifications** to determine the electrical ratings and specifications of your Liebert MPX. It is imperative that the input power supply ratings and connections match the specifications of the unit being installed.

WARNING

Opening or removing the cover of any Liebert MPX module with exception of the RPC cover on the MPX PEM module, may expose you to lethal voltages within the unit.

Observe all cautions and warnings in this manual. Failure to do so may result in serious injury or death.

Do not attempt to service this product. Liebert MPX modules contain no user-serviceable parts. If you need support or have questions about your Liebert MPX, contact Emerson Network Power Distributed Processing Applications or your local Emerson representative. Do not attempt to service this product yourself.

Never work alone.

WARNING

The Liebert MPX contains high voltage that could cause serious personal injury or death. The Liebert MPX must be installed in a restricted-access location.

A restricted-access location is an area where access is possible only through the use of a tool or lock and key or other means of security, and is controlled by the authority responsible for the location. Access to the restricted location can be gained only by service personnel or users who have been instructed about the reasons for the restrictions applied to the location and about any precautions that should be taken.

CAUTION

Connecting your Liebert MPX and rack equipment to an input power supply with an incorrect rating in voltage, amperes or phase may damage the connected equipment and your Liebert MPX.

If you have questions about the power supply connections, contact Emerson Network Power Applications Engineering or your local Emerson representative.

CAUTION

Shut down and unplug all equipment in your rack enclosure before beginning to install a Liebert MPX or to connect input power to the unit.

Never attempt to uninstall an MPX PEM (Power Entry Module) from the power distribution unit while input power is connected, attempting to do so may damage the Liebert MPX or connected equipment or expose the user to lethal voltages.

During normal operation, MPX BRMs (Branch Receptacle Modules) are hot-swappable. While adding or removing an MPX BRM no user loads can be connected to the MPX BRM. Attempting to do so may damage the Liebert MPX or connected equipment.

When connecting the rack equipment to the Liebert MPX's receptacles, arrange cables and connections to avoid tangling and crisscrossing the power cables. For power management purposes, record the receptacle where each piece of equipment is connected. Receptacles on the Liebert MPX have a numerical designation. A Liebert MPX with more than one circuit has the outlets named with numbers and are grouped by branch with a number referring to the proper circuit breaker.

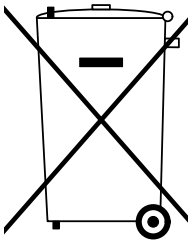
CAUTION

All configuration steps must be completed before attempting to start up equipment connected to the Liebert MPX.

Notice to European Union Customers: Disposal of Old Appliances

This product has been supplied from an environmentally aware manufacturer that complies with the Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/CE.

This product uses components that are dangerous for the environment, such as electronic cards and other electronic components. Any component that is removed must be taken to specialized collection and disposal centers. If this unit must be dismantled, this must be done by a specialized center for collection and disposal of electric and electronics appliances or other dangerous substances.



The "crossed-out wheelie bin" symbol at right is placed on this product to encourage you to recycle wherever possible. Please be environmentally responsible and recycle this product through your recycling facility at its end of life. Do not dispose of this product as unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of waste electrical and electronic equipment (WEEE).

For information regarding the scrapping of this equipment, please browse **http://www.eu.emersonnetworkpower.com** ("Products session" or "Contact us" session) or call our worldwide technical support:

- 00 80011554499 (toll free number)
- +39 0298250222 (toll number based in Italy)

RoHS Compliance

The Liebert MPX modules comply with the Restriction of Hazardous Substances Directive (RoHS), prohibiting use of six hazardous materials manufacturing of electronics, including lead-free solder.

FCC Compliance

This unit complies with the limits for a Class A device pursuant to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

NOTE

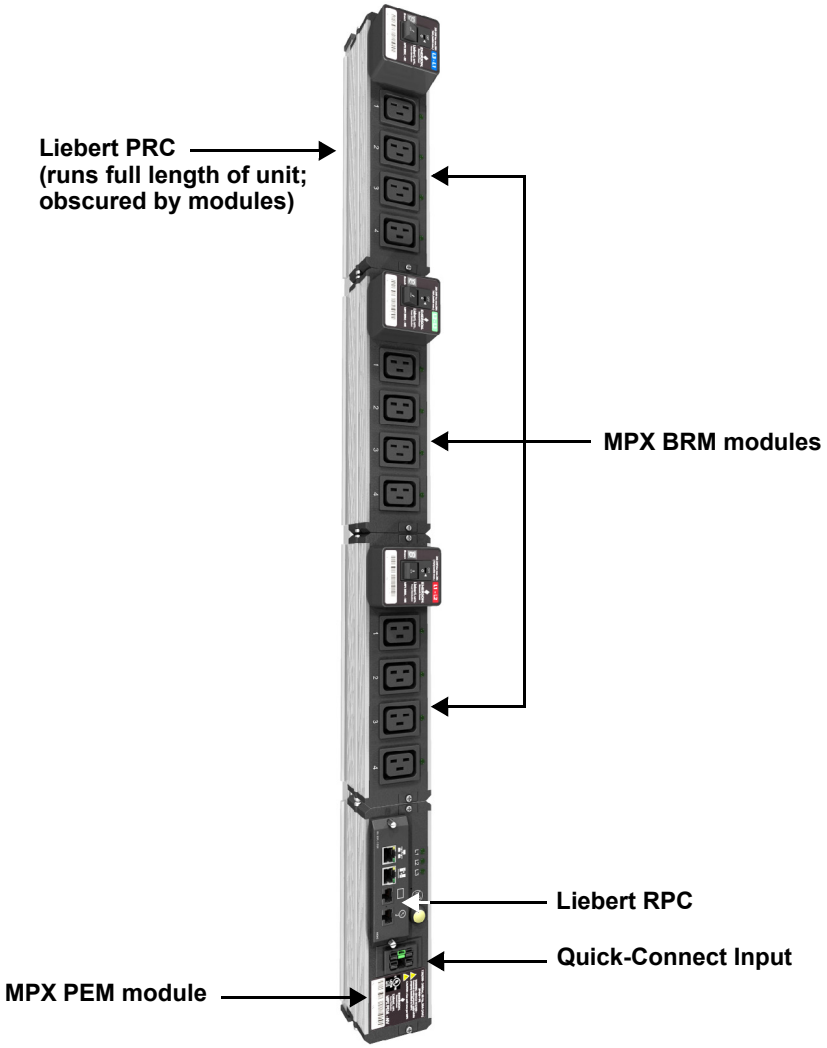
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference that the user must correct, including the expense of all corrective modifications.

1.0 LIEBERT MPX INTRODUCTION

The Liebert MPX is an Adaptive Rack PDU (power distribution unit) built with modular and scalable components that can be installed and reconfigured on-site to meet varying input and output power connectivity needs. The Liebert MPX Adaptive Rack PDU family consists of the following components:

- MPX PRC™—(Power Rail Chassis) distributes intermodule power, communications and serves as the mounting base for all Liebert MPX components.
- MPX PEM™—(Power Entry Module) delivers power to the Liebert MPX and includes provisions for remote and local communication options. Detachable and non-detachable cord versions are available.
- MPX IPC™—(Input Power Cord) is a detachable input power cord required for some versions of MPX PEM. A variety of single- and three-phase plug types are available.
- MPX BRM™—(Branch Receptacle Module) distributes overload-protected output power to user loads. Hot swappable design allows for reconfiguration with choice of receptacle type, quantities, and monitoring / control to the receptacle level.
- Liebert RPC™—(Rack PDU Card) optional network interface card to manage and monitor power distribution to connected equipment; installs in the MPX PEM communication card slot. Allows for multiple Liebert MPXs to be interconnected and managed from a single network connection.
- RPCBDM™—(Basic Display Module) optional LCD for local monitoring of Liebert MPX units. Cord-connected, allowing user to select rack mounting location.

Figure 1 Liebert MPX assembly diagram



2.0 LIEBERT MPX SYSTEM MODULES

2.1 MPX PRC—Power Rail Chassis/Power and Communication Bus

The MPX PRC acts as the fundamental building block of the Liebert MPX. Power and Communications buses are integrated into the full length of the MPX PRC. The MPX BRM (Branch Receptacle Modules) and MPX PEM (Power Entry Module) lock onto the MPX PRC, adding power input, power output, monitoring and management, depending on the type of module.

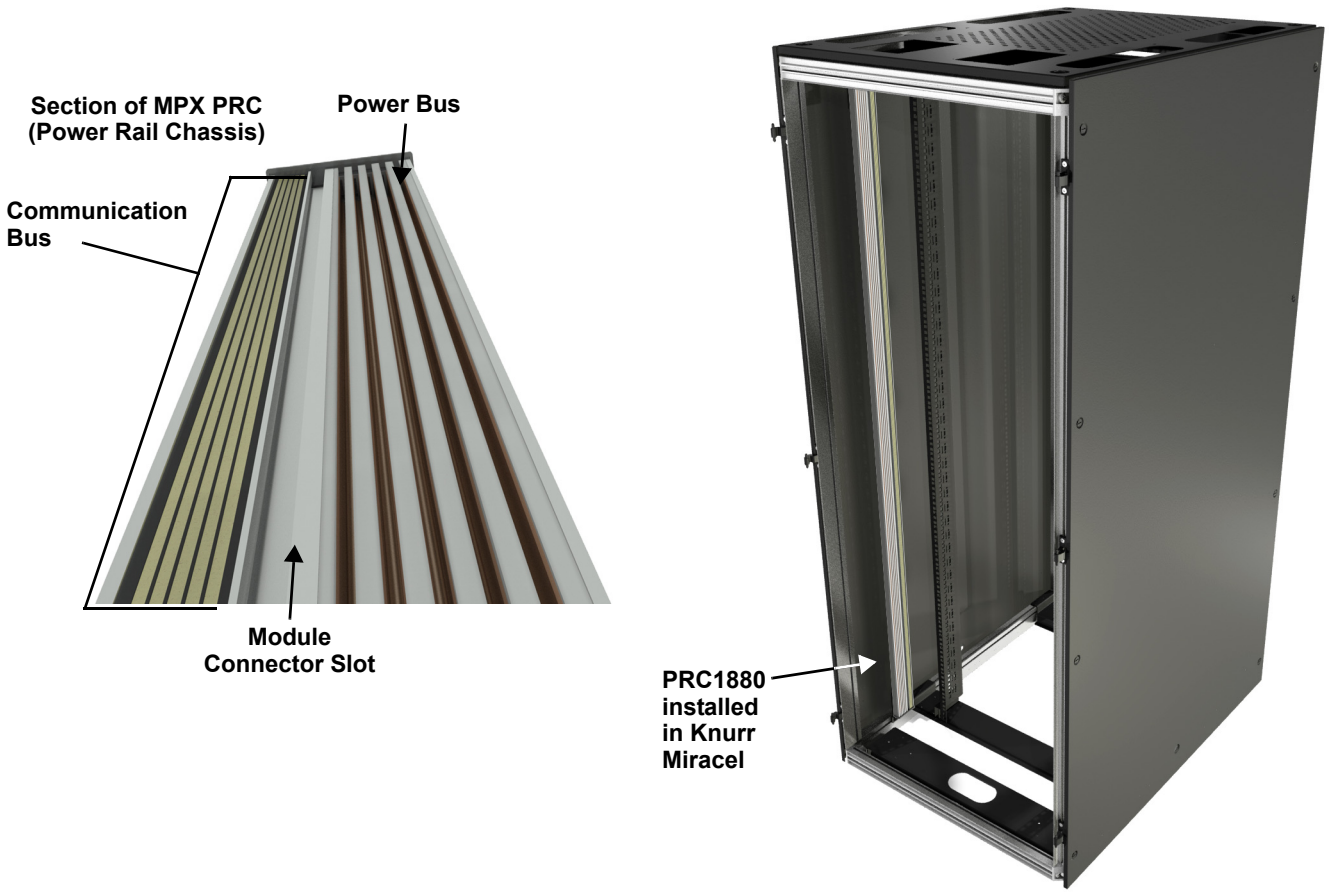
The MPX PRC is available in two lengths:

Part #	Length, mm (in)	Typical Cabinet Size
MPXPRC-V1880XXX	1880 (74.07)	42U
MPXPRC-V1035XXX	1035 (40.78)	23U

The MPXPRC-V1880XXX will accommodate up to six standard size (266 mm) MPX BRMs (Branch Receptacle Modules); the MPXPRC-V1035XXX will accept up to three MPX BRMs. Each size of MPX PRC also accepts a single MPX PEM. The PRC1035 will only accept variable capacity MPX PEM versions to retain the ability to carry the full complement of three standard size MPX BRMs.

The MPX PRC has five power bus slots that allow the connection of the MPX PEM and MPX BRM modules to three phases of power, neutral and protective earth. A communication bus provides the path through which the Liebert RPC, MPX PEM and MPX BRM modules communicate. The MPX PRC also has a module connector slot that permits secure attachment of MPX PEM and MPX BRM modules via their integral connectors. Spacer covers are available to cap off unused sections of the MPX PRC's surface. The spacer covers reserve positions to insert MPX BRMs for future expansion.

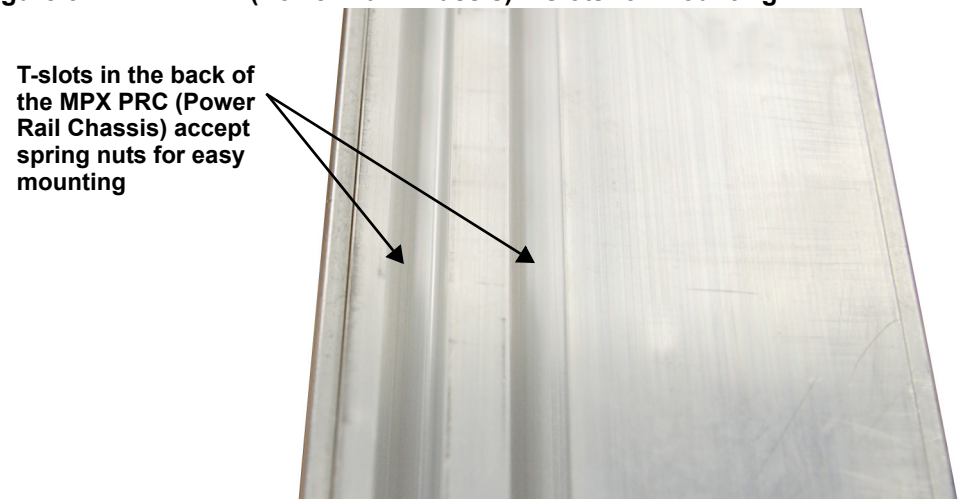
Figure 2 MPX PRC (Power Rail Chassis) components



2.1.1 Mounting Features

The back of the MPX PRC features T-slots running the length of the unit. These may be used for mounting the assembled units in racks, such as the Knurr® Miracel™ Rack.

Figure 3 MPX PRC (Power Rail Chassis) T-slots for mounting



2.2 Liebert PEM—Power Entry Module/ Power Input

The MPX PEM centralizes the connectivity of Liebert's MPX's power input and communication ports. The MPX PEM securely fastens onto the MPX PRC (Power Rail Chassis) to deliver polyphase power from its power supply cord to the power bus. The Liebert RPC is installed into the MPX PEM for its operating power and connection to the communication bus.

The MPX PEM is available in North American and European models with either Variable-Capacity or Fixed-Capacity configurations. Both configurations' power supply cords are available in a variety of single and three-phase NEMA and IEC plug styles and ratings.

The Variable-Capacity models require connection of a detachable MPX IPC (See **2.2.1 - MPX IPC—Input Power Cord/Communication**) to its power inlet. The power input ratings are determined by the plug type. The user may change the MPX IPC with a different plug type and ratings from single phase to three-phase to suit his/her needs.

NOTE
Up to 30A per phase is supported for North American models; up to 32A per phase is supported for European models.

The Fixed-Capacity models are physically larger and have non-detachable power supply cords.

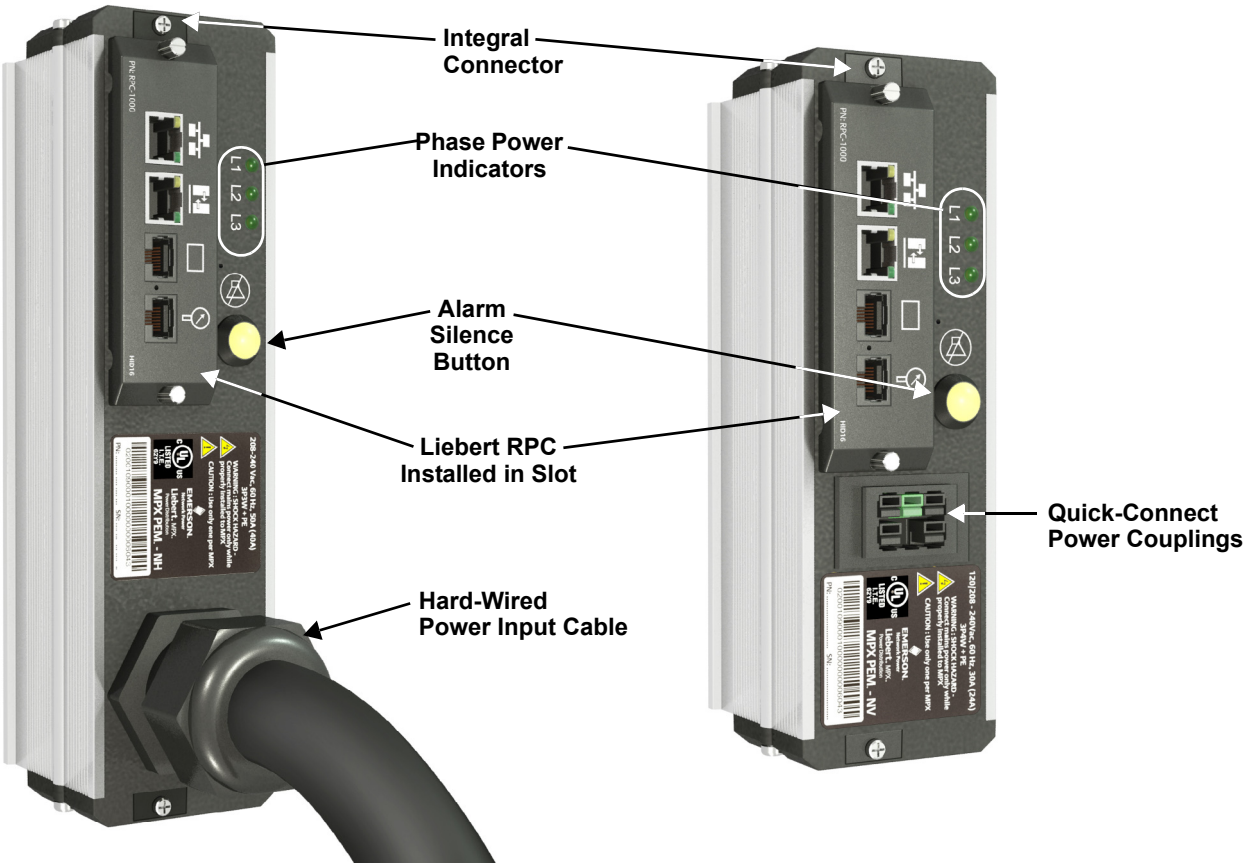
NOTE
Up to 60A per phase is supported for North American models; up to 63A per phase is supported for European models.

All models provide metering of the polyphase inputs, including individual line voltage and current, total kW and total kWH. Additionally, individual line current alarming and operational status are supported.

Other important features include:

- Three visual indicators alert the user to the current condition of each power input.
- Audible alarm is enabled during certain overcurrent conditions. The audible alarm may be tested or silenced by pressing the button.

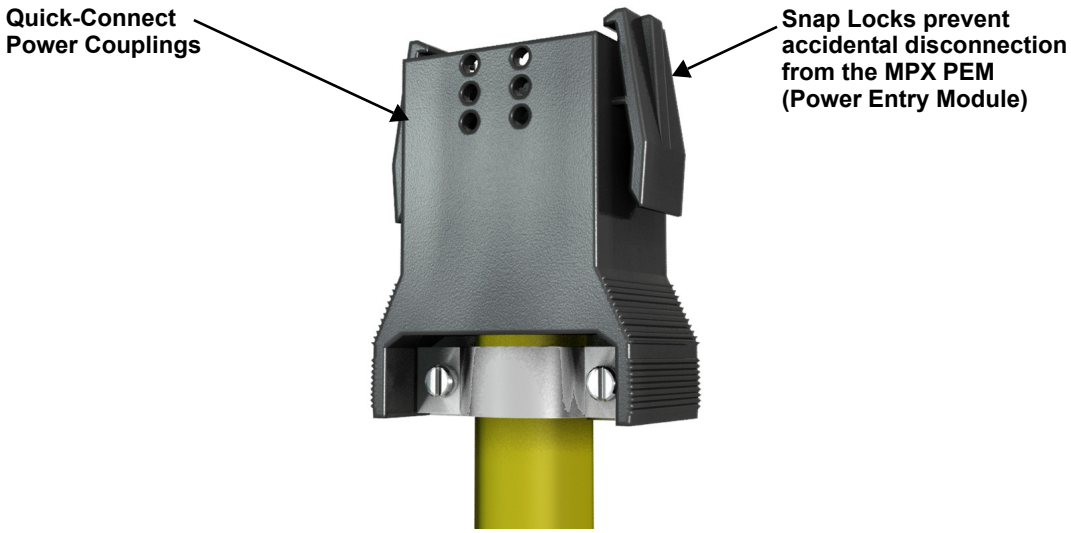
Figure 4 MPX PEM (Power Entry Module) features



2.2.1 MPX IPC—Input Power Cord/Communication

The MPX IPC is a detachable input power cord that permits changing the input power source for Variable-Capacity versions of the MPX PEM. A variety of single- and three-phase NEMA and IEC plug types are available. The MPX IPC is not required for the Fixed-Capacity MPX PEM.

Figure 5 MPX IPC connector



2.3 MPX BRM—Branch Receptacle Module/Power Output

The MPX BRM provides output power distribution to user load equipment. All MPX BRMs include output receptacles (NEMA, Schuko or IEC) that are overload-protected by 100% rated hydraulic-magnetic circuit breakers.

MPX BRMs are hot-swappable to allow user installation without powering down the Liebert MPX. Up to three standard sized (266mm) MPX BRMs can be deployed on a Liebert MPX utilizing the MPX PRC (Power Rail Chassis) for typical 23U racks and up to six standard size MPX BRMs (Branch Receptacle Modules) for units utilizing the 1880mm MPX PRC for typical 42U racks. All MPX BRMs include an LED ID indicator that uniquely identifies the individual module with a numeric value.

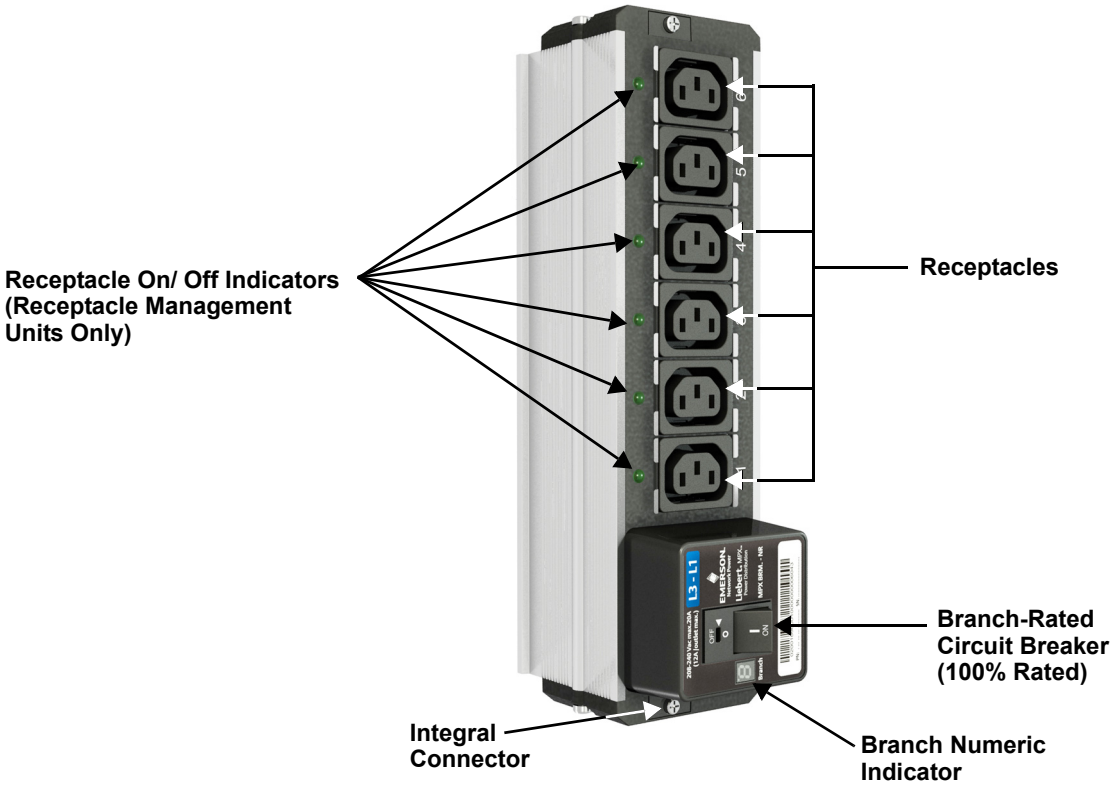
North American and European models of the MPX BRM are available in the following versions and features:

- Branch Monitoring version of the MPX BRM provides aggregate metering, including voltage, current, kW, kVA and kW-h. Additionally, current alarming and operational status are supported.
- Receptacle Management version of the MPX BRM provides the same features as the Branch Monitoring models, plus the control, metering and current alarming of individual receptacles. The receptacles may either be turned On or Off remotely or programmed for automatic power-on sequencing.

Other important features include:

- A numeric indicator to provide module identification
- For Receptacle Management versions, a visual indicator per receptacle alerts the user to the current condition of the load.
- The circuit breaker may be opened with the use of a tool. Open circuit breaker detection causes the numeric indicator to flash.
- Voltage phasing is determined by the power blade configuration on the bottom of each MPX BRM, and is clearly marked on the color coded label.
- IEC C13 receptacle types are provided with retaining clips to provide strain relief for the Load's power supply cord.

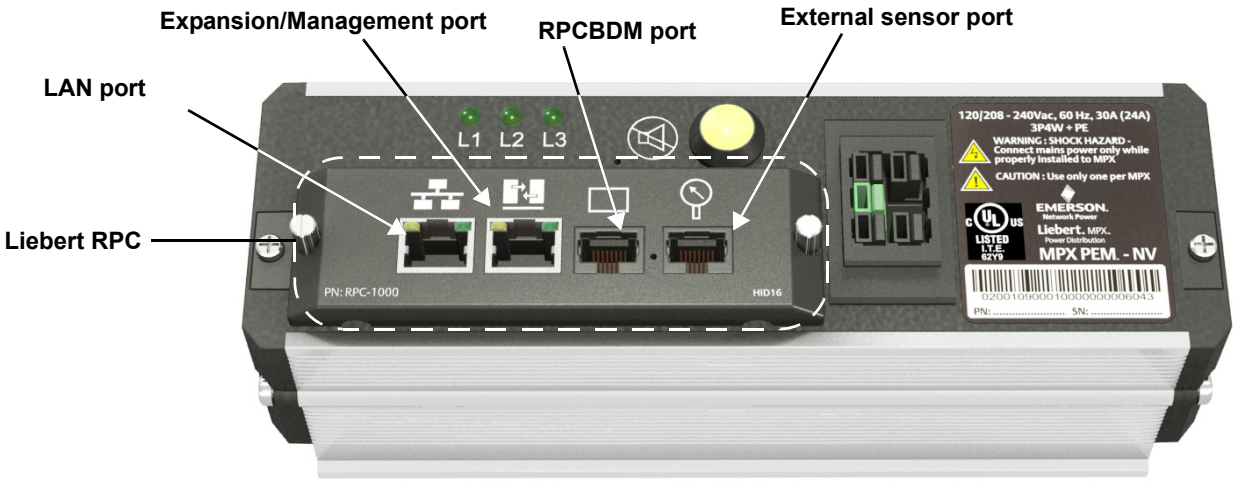
Figure 6 MPX BRM (Branch Receptacle Module)



2.4 Liebert RPC—Rack PDU Card

The Liebert RPC centralizes local and remote management for the Liebert MPX. It provides Web and SNMP management for systems connected to an Ethernet network. The Liebert RPC also serves as the connection point for multiple support capabilities and devices including the RPC Basic Display Module (RPCBDM), various optional environmental sensors and "sibling" connection to other Liebert MPX or Liebert MPH systems. The Liebert RPC is equipped with RJ-45 jacks for all connections and requires no custom cables. The card supports 10 and 100 Mbit Ethernet and provides for in-the-field upgrade of firmware. The Liebert RPC is user-installed in a slot in the MPX PEM (Power Entry Module).

Figure 7 Liebert RPC (rack PDU card) in an MPX PEM (Power Entry Module)



2.4.1 RPCBDM—RPC Basic Display Module

The optional RPCBDM provides local display of monitored data for all connected Liebert MPX and Liebert MPH systems. Display information is accessed via a navigation switch on the RPCBDM. The RPCBDM is cable-connected to the Liebert RPC allowing the user to locate the display to suit the local reading requirements. A 2-meter cable and general mounting provisions are provided. A single display can be used for up to four Liebert MPX or Liebert MPH Rack PDUs connected in a Rack PDU Array™.

Figure 8 RPCBDM

3.0 Liebert MPX Installation and Assembly

3.1 Installation in a Knurr Miracel Rack

Emerson recommends installing the MPX PRC (Power Rail Chassis) in the rack, then attaching the Liebert MPX modules to it.

Before beginning, consider how cables will be routed in the rack. Placing the MPX PEM (Power Entry Module) at the end of the MPX PRC that is nearest the entry point for its input power cable can ease cable routing and help separate control and power cables to reduce electromagnetic interference.

A Liebert MPX can be installed in a Knurr Miracel rack on either the upright or horizontal frame member with the included hardware. The unit can be installed on the face of the frame member or on the side of the frame member.

Installation requires inserting two spring nuts into the Liebert MPX, screwing Liebert MPX mounting screws into the spring nuts and attaching two brackets to the Knurr Miracel frame members. The Liebert MPX hangs on the brackets and is supported by the Liebert MPX mounting screws.

3.1.1 Mounting Hardware Included

- Z-shaped brackets: 2
- L-shaped bracket: 2
- Spring-nuts, M5: 6
- Screws, M5x10: 6
- Liebert MPX mounting screws, 2

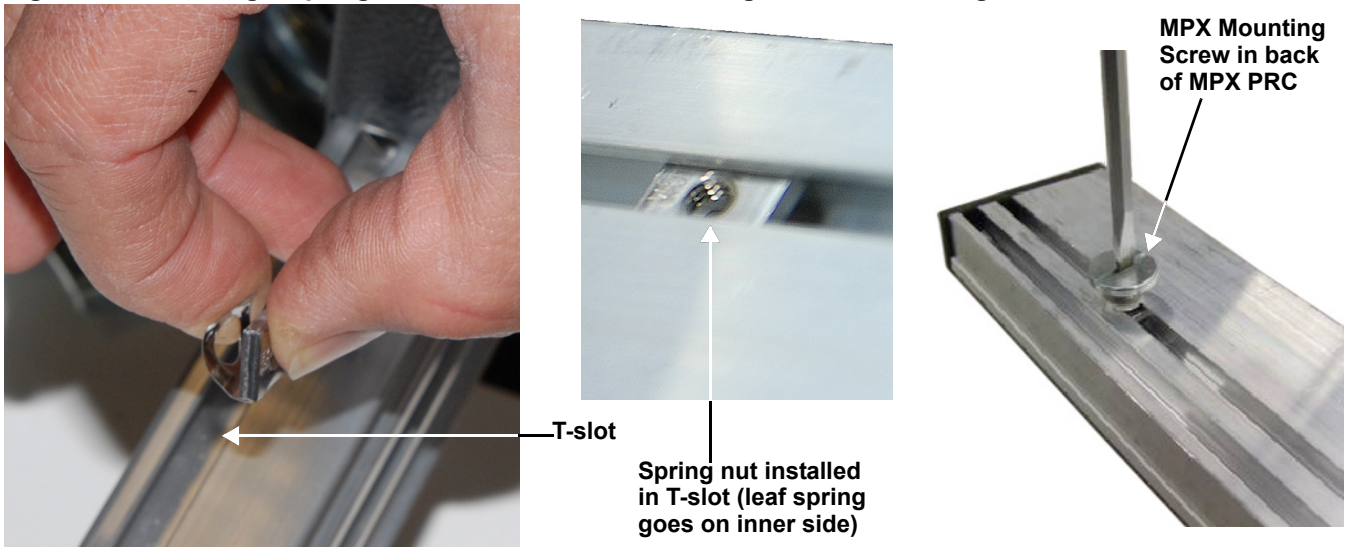
3.1.2 Tools Required—Field-Supplied

- Slotted screwdriver
- 4mm Allen wrench

3.1.3 Prepare the Liebert MPX for Mounting

1. Insert two spring nuts into the T-slot on the back of the MPX PRC, one near either end (see **Figure 9** for how to insert a spring nut).
2. Position the spring nuts where the brackets to be used will be positioned (either the Z-shaped or L-shaped brackets). To move a spring nut, press down on it with a small, pointed object and slide it into position.
3. Thread an MPX mounting screw into the spring nut and tighten a few turns. Leave enough space for the bracket to slip over the screw's head and rest on the body of the screw.

Figure 9 Inserting a spring nut into a T-slot and attaching an MPX mounting screw



3.1.4 Attach Brackets to a Knurr Miracel Horizontal Frame Member

1. Insert two spring nuts into the T-slot on the upper horizontal frame member.
   a. To use the Z-shaped bracket, insert the spring nuts into the T-slot on the face of the horizontal frame member (see **Figure 10**).
   b. To use the L-shaped bracket, insert the spring nuts into the T-slot on the thinner side of the horizontal frame member (see **Figure 10**).
2. Position the spring nuts to accommodate screws inserted through slots in the brackets. To move the spring nuts, press down on each with a small, pointed object and slide each into position.
3. Hold the bracket in place and attach it with two of the M5x10 screws with hex heads.
4. Tighten the hex-head screws firmly with the Allen wrench.
5. Repeat **Steps 1** through **4** for the lower horizontal frame member. The brackets must be directly in line with each other for the Liebert MPX to be installed.
6. After the brackets are attached, hang the Liebert MPX in the rack by inserting the Liebert MPX mounting screws into the slots on the brackets (see **Figure 12**).
7. Tighten the Liebert MPX mounting screws securely.

Figure 10 Attaching brackets to a horizontal frame member

Z-Shaped Bracket on Knurr Miracel Horizontal Frame Member

L-Shaped Bracket on Knurr Miracel Horizontal Frame Member

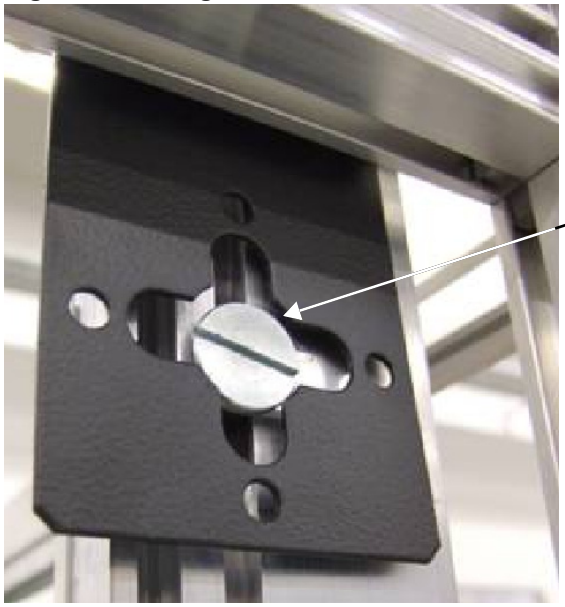
3.1.5 Attach L-Shaped Brackets to an Upright Frame Member of the Knurr Miracel

1. Insert two spring nuts into the T-slot on a rear upright frame member (see **Figure 11**).
2. Position the spring nuts to accommodate screws inserted through slots in the brackets. To move the spring nuts, press down on each with a small, pointed object and slide each into position.
3. Hold an L-shaped bracket in place and attach it with two of the M5x10 screws with hex heads.
4. Tighten the hex-head screws firmly with the Allen wrench.
5. Repeat **Steps 1** through **4** for the lower L-shaped bracket. The brackets will attach the Liebert MPX more securely if one is near the top of the unit and one is near the bottom.
6. After the brackets are attached, hang the Liebert MPX in the rack by inserting the Liebert MPX mounting screws into the slots on the brackets (see **Figure 12**).
7. Tighten the Liebert MPX mounting screws securely.

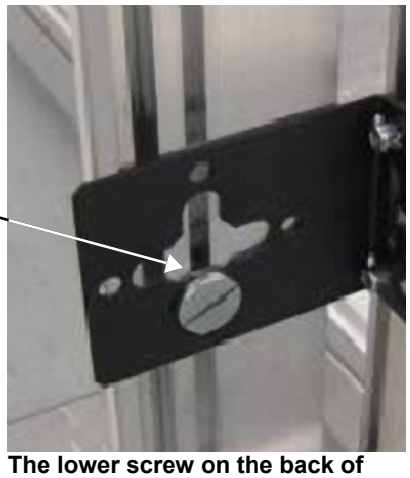
Figure 11 Attaching brackets to an upright frame member

L-Shaped Bracket
on Knurr Miracel Upright Frame Member

Figure 12 Hang Liebert MPX on a bracket



MPX mounting screw fits through the center of the bracket and slips into a slot



The lower screw on the back of the MPX PRC will sit in the bottom of the middle slot in either type of mounting bracket used

3.2 Liebert MPX System Assembly

3.2.1 Attach an MPX PEM or MPX BRM to the MPX PRC

WARNING

The Liebert MPX may present an electrical shock hazard. Input power should be connected only after the Liebert MPX is fully assembled.

After the MPX PRC (Power Rail Chassis) has been installed in the rack, it is ready for attachment of an MPX PEM (Power Entry Module) and then the MPX BRMs (Branch Receptacle Modules).

Emerson strongly recommends attaching the MPX PEM first, positioning it at either end of the MPX PRC. The module's position will not adversely affect operation, but placing it at the end of the chassis will ease cable routing and separation of power and control cables in the rack.

Proper orientation of the MPX PRC is required to allow for the best use of the top or bottom entry into your rack. If cables will enter through the top of the rack, be sure that the MPX PRC has the power bus to the right side. This will put the MPX PEM in a position where the input cord will be closest to the top of the rack.

If cables will enter through the bottom of the rack, be sure that the MPX PRC is oriented so that the power bus is to the left side. This will put the MPX PEM in a position where the input cord will be closest to the bottom of the rack.

To balance the loads, be sure that the installed MPX BRMs have more than one unique line configuration (L1-L2, L2-L3, L3-L1, L1-N, L2-N, L3-N). This will help to ensure that none of the phases is overloaded.

If the MPX PEM is a Variable-Capacity model, an MPX IPC (input power cord) is required. Last, an optional Liebert RPC (rack PDU card) can be installed.

CAUTION

Never attach more than one MPX PEM to an MPX PRC. Attaching more than one MPX PEM can damage connected equipment and the Liebert MPX.

CAUTION

Before beginning to assemble the Liebert MPX:

- Ensure that utility power is not connected to any module or component.
- Ensure that no equipment is connected to the MPX BRM (Branch Receptacle Module).
- Ensure that the circuit breaker on the MPX BRM is Off.

3.2.2 Tools Required

Assembling a Liebert MPX requires a Phillips head screwdriver.

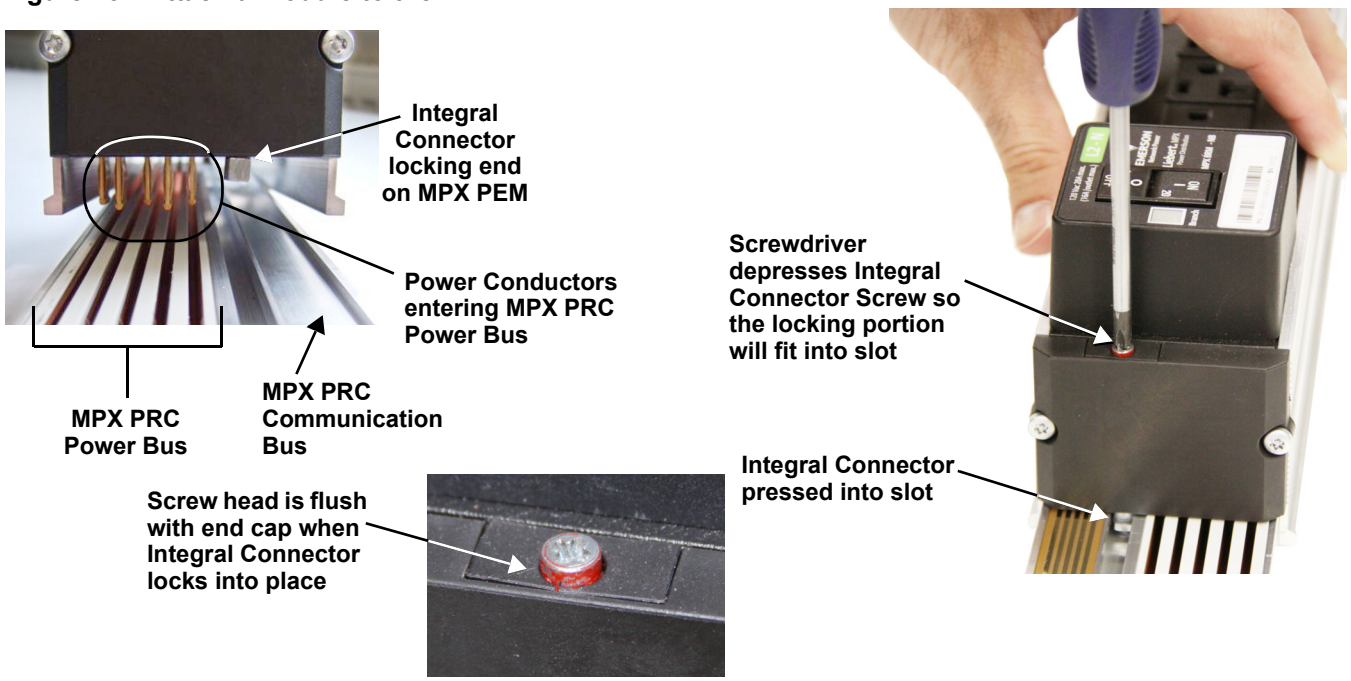
To attach either the MPX PEM or a MPX BRM:

1. Orient the module so that the power conducting tabs fit into the power bus on the MPX PRC and the communication contacts will fit into the MPX PRC's communication bus (see **Figure 13**).
2. Make sure that the integral connectors at each end of the module are oriented so they will fit into the slot on the MPX PRC (Power Rail Chassis).
3. Press the module firmly onto the MPX PRC.
4. Secure the module to the Power Rail Chassis with the integral connectors; there is one on each end.
   a. Use a Phillips head screwdriver to press each connector down.
   b. Turn the screw until it locks and tightens, about three-quarters of a turn.

CAUTION

Do not exceed a maximum torque of 18 in/lb (2Nm) when turning the connector on either end cap. Exceeding the torque rating can damage the connector.

Figure 13 Attach a module to the MPX PRC


Integral Connector locking end on MPX PEM
Power Conductors entering MPX PRC Power Bus
MPX PRC Power Bus
MPX PRC Communication Bus
Screw head is flush with end cap when Integral Connector locks into place
Screwdriver depresses Integral Connector Screw so the locking portion will fit into slot
Integral Connector pressed into slot

5. Repeat **Steps 1** through **4** for each additional module.

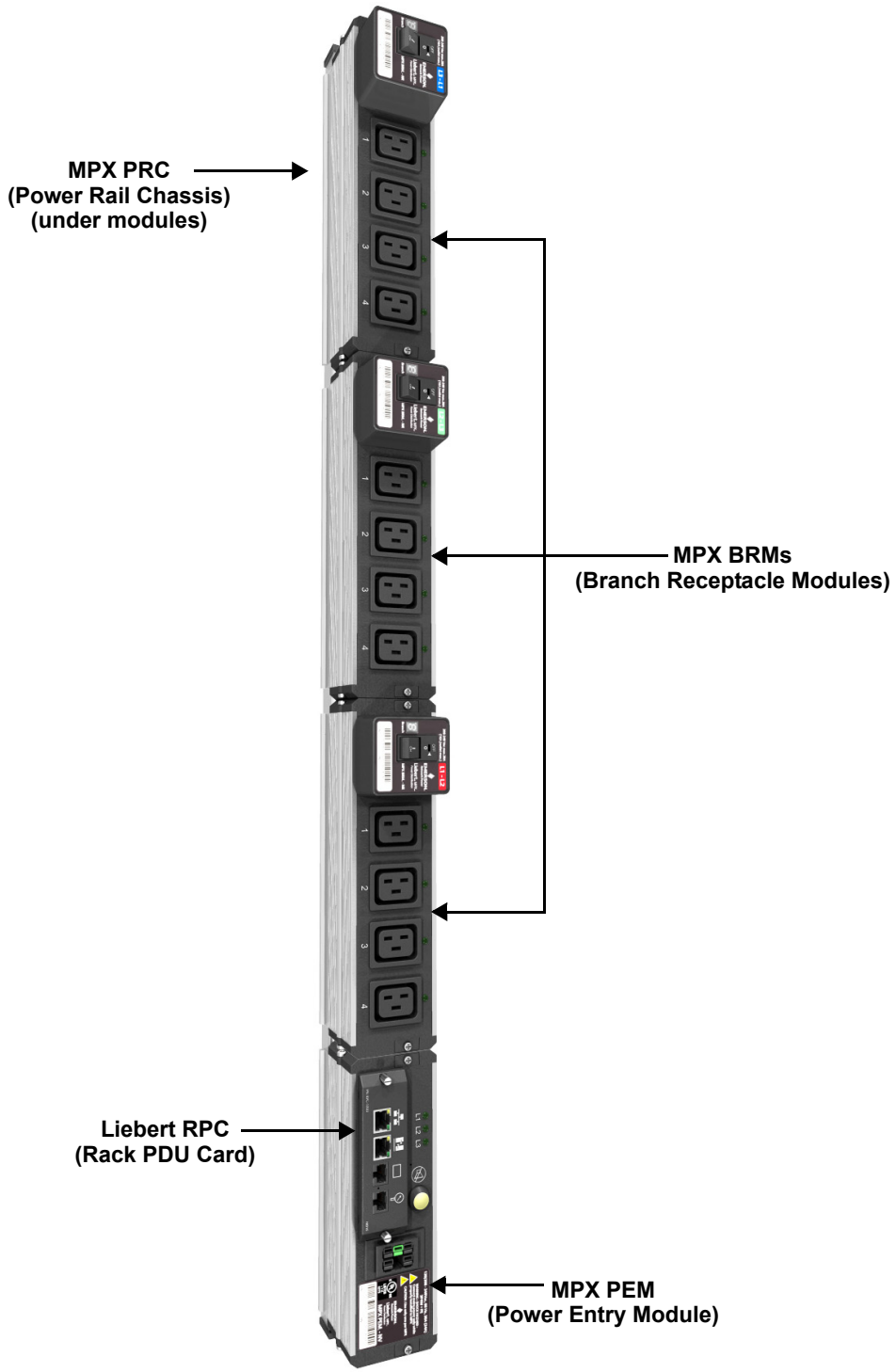
   If the unit being assembled is based on the PRC1035, it will accommodate up to three Standard MPX BRMs. The PRC1880 will accommodate up to six 266mm Standard MPX BRMs in addition to the MPX PEM (Power Entry Module).

   The PRC1035 is 1035mm long and fits a typical 23U rack; the PRC1880 is 1880mm long and fits a typical 42U rack.

NOTE

The Liebert MPX will operate properly if spaces exist between modules, but adding modules will be hampered unless the space left is the size of a standard MPX BRM. Decorative covers are available to reserve the proper space on the MPX PRC and to protect any unused sections of the unit's surface.

Figure 14 Liebert MPX assembled



3.2.3 Attach an MPX IPC to an MPX PEM—Variable-Capacity MPX PEM Only

Variable-Capacity MPX PEM (Power Entry Module) versions require an MPX IPC (input power cord) to connect to utility power. The MPX IPC is available with various input plugs for single-phase or 3-phase and up to 30A (32A European version).

Quick-connect couplings are attached to the MPX IPC to ease proper connection to the Power Entry Module. The connectors fit only one way, mating the proper input, ground and neutral wires on the power cord to the MPX PEM.

To attach the MPX IPC to an MPX PEM:

1. Ensure that utility power is not connected to any module or component.
2. Ensure that the MPX IPC is not connected to utility power.
3. Insert the quick-connect coupling on the MPX IPC into the connector on the MPX PEM. It will lock into place. Tug on the cord to determine whether it is securely attached to the MPX PEM.

Figure 15 Quick-connect couplings on MPX IPC (input power cord) and MPX PEM (Power Entry Module)

3.2.4 Install an Optional Liebert RPC in the MPX PEM

Installing a Liebert RPC (rack PDU card) in the MPX PEM (Power Entry Module) permits monitoring a Liebert MPX either over a network or with an MPX BDM (basic display module). For complete details, refer to the Liebert RPC user manual, SL-20825, or quick-start guide, SL-20826, each available in the monitoring area of Liebert's Web site, **www.liebert.com**

1. Locate the communication card bay on the MPX PEM. You might need to remove a cover.
2. Insert the Liebert RPC into the MPX PEM and secure it with the provided screws.
3. The Liebert RPC has four ports designated by icons: a LAN port, Expansion/Management port, Display port, and Sensor port. Connect an Ethernet cable (not included) to the LAN port, identified by the icon on the right:

4. Connect the Ethernet cable to a computer.

3.3 Temperature/Humidity Sensor Installation—Optional

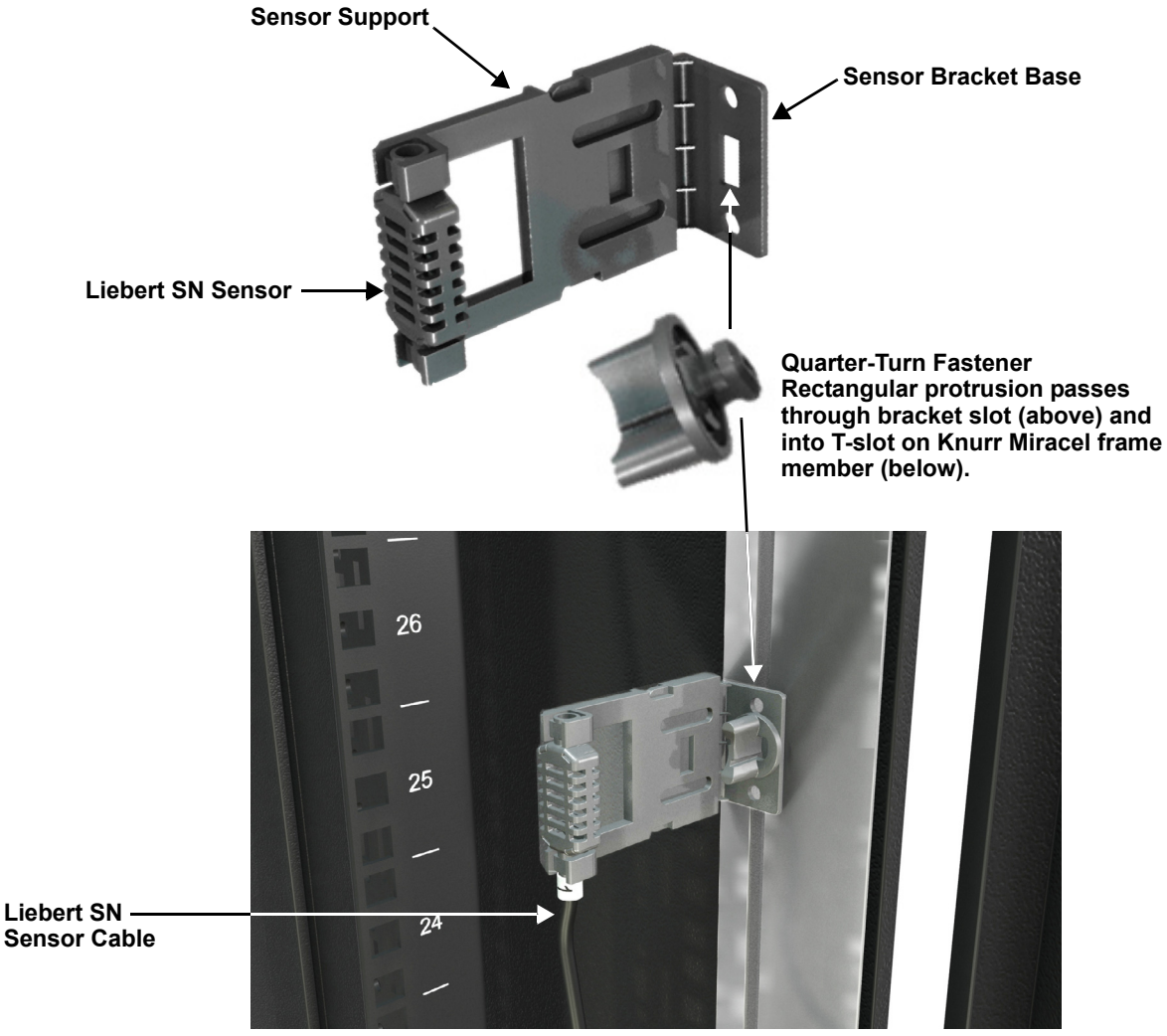
Optional Liebert SN temperature/humidity sensors are available to assist in monitoring conditions in the rack. Liebert SN sensors are designed for installation in a Knurr Miracel without tools, but each may be placed in any area to monitor temperature and humidity levels. Each connects to the Liebert RPC, which makes readings available to Liebert MPX monitoring methods.

Only one mounting method is addressed in this manual: attaching a single sensor with a bracket to a Knurr Miracel frame member. For details on other mounting locations and methods, refer to the Liebert SN quick-start guide, SL-20840, or to the Liebert RPC user manual, SL-20825. Each is available at Liebert's Web site, **www.liebert.com**

To install a sensor on a Knurr Miracel frame member:

1. Assemble the Liebert SN and sensor bracket:
   a. Insert the sensor bracket base into one end of the sensor support as shown in **Figure 16**.
   b. Snap the sensor into the other end of the sensor support.
2. Choose where in the rack to install the sensor assembly. Emerson recommends placing the sensor in the area that is likely to be warmest.
3. Hold the sensor bracket on a T-slot on the Knurr Miracel frame where the sensor will be placed.
4. Insert the included quarter-turn fastener through the rectangular hole in the sensor bracket base and into the T-slot (see **Figure 16**).
5. Turn the fastener clockwise 90 degrees, a quarter of a turn.
6. Route the sensor cable to the Liebert RPC and insert it into the card's external sensor port.
   For further details, refer to the Liebert RPC user manual, SL-20825, which shipped with the card and is available at Liebert's Web site: **www.liebert.com**

Figure 16 Temperature/humidity sensor mounting



3.4 Install an Optional RPCBDM in the Rack

The RPCBDM (Basic Display Module) can be mounted in the rack with either the included hardware or with a cable tie through the slot on the back of the module (see **Figure 17**). Either method permits moving the RPCBDM to a different place in the same rack or to another rack.

3.4.1 Mounting Hardware

- Spring nut M5: 1
- Spacer sleeve: 1
- Special MPX screw: 1
- Cable clip: 1

Tools Required

- Flat-blade screwdriver

3.4.2 RPCBDM Installation on Knurr Miracel Frame

1. Determine the mounting location in the rack.
2. Insert a spring nut into a T-slot on the frame member where the RPCBDM will be installed (refer to **Figure 9**).
3. Insert the Liebert MPX screw into the spacer sleeve.
4. Insert the Liebert MPX screw into the spring nut and tighten securely with the screwdriver.
5. Hang the RPCBDM on the Liebert MPX screw with the hooded mounting slot on the back of the RPCBDM (see **Figure 17**).
6. Connect the RPCBDM to the Liebert RPC with an Ethernet cable.
   Be certain to connect the cable to the correct port on the Liebert RPC (see **Figure 18**).

Figure 17 RPCBDM installation in rack

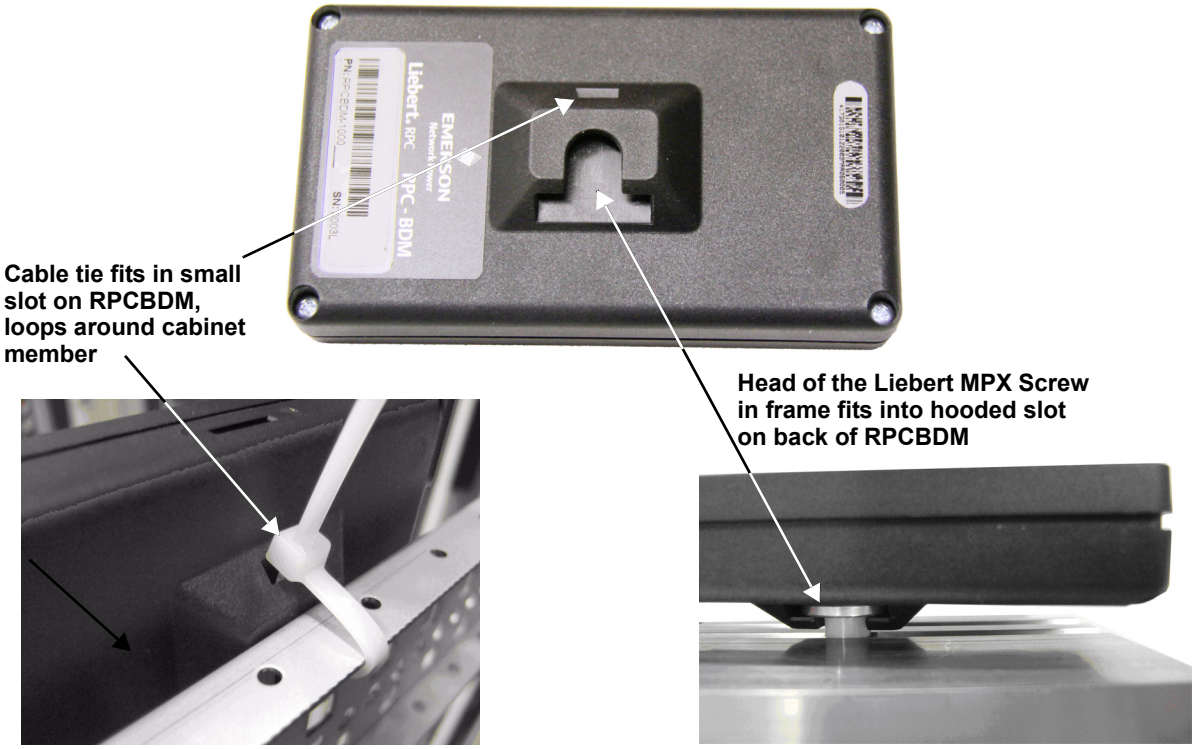
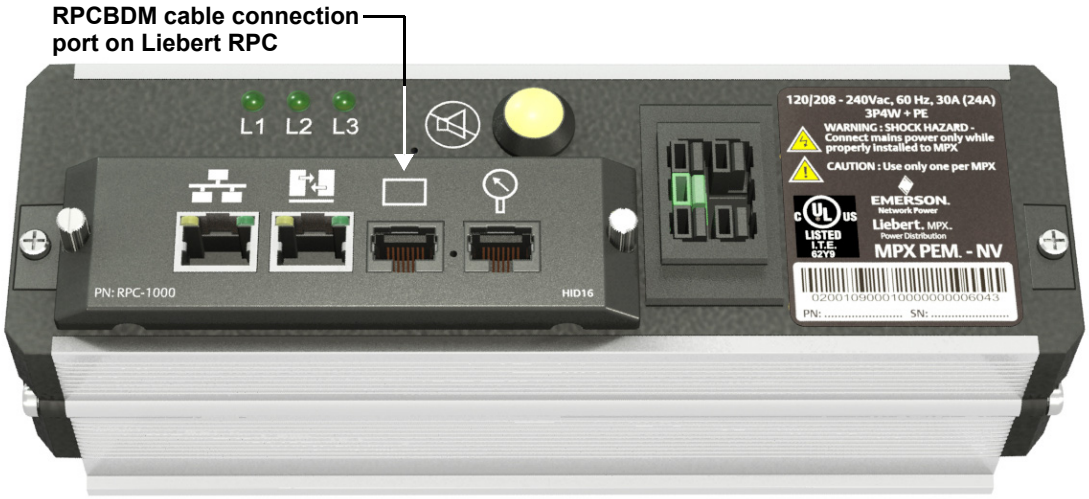

Cable tie fits in small slot on RPCBDM, loops around cabinet member
Head of the Liebert MPX Screw in frame fits into hooded slot on back of RPCBDM
EMERSON
Liebert RPC
RPC- BDM

Figure 18 RPCBDM cable connection port on Liebert RPC


RPCBDM cable connection port on Liebert RPC
L1
L2
L3
120/208 - 240Vac, 60 Hz, 30A (24A)
3P4W + PE
WARNING : SHOCK HAZARD - Connect mains power only while properly installed to MPX
CAUTION : Use only one per MPX
EMERSON. Network Power
Liebert. MPX. Power Distribution
MPX PEM. - NV
PN: RPC-1000
HID16

4.0 SYSTEM FUNCTIONAL TEST

4.1 Checklist for Liebert MPX Assembly

Follow these guidelines steps to verify that all components are properly assembled.

___ 1. MPX PRC (Power Rail Chassis) is securely attached to the rack.

___ 2. MPX PEM (Power Entry Module) is attached to the MPX PRC.
Ensure that the MPX PEM is securely locked onto the MPX PRC.

___ 3. Power input cable is attached to the MPX PEM, if applicable.
Variable-Capacity models have detachable cables with quick-connect couplings; Fixed-Capacity models have integral cables.

___ 4. Optional Liebert RPC (Rack PDU Card) is installed in the MPX PEM.

___ 5. MPX BRM (Branch Receptacle Modules) are installed; the number of modules that may be attached varies according to the length of the Power Rail Chassis.

4.2 Test the Liebert MPX's Functionality

Perform these steps to determine whether the Liebert MPX is ready for use.

1. Ensure that all circuit breakers on the MPX BRMs are Off.
2. Connect the Liebert MPX unit to input power.
3. Connect equipment to the MPX BRMs.
4. Make sure the equipment to be connected to the Liebert MPX is switched Off.
5. Attach communication cables to the Liebert RPC, if one is installed in the Liebert MPX.
6. Switch On the circuit breaker of each MPX BRM where the load is connected.
7. Check the Phase Power Indicators on the MPX PEM to verify that input power is present. The appropriate number of lights on the MPX PEM should be green and lit but not flashing:
   - input power is 3-phase—all lights should be green
   - input power is single-phase—one light should be green
   - input power is 208-240 L1 and L2 should be green.
8. Verify that each attached MPX BRM is displaying a non-repeated identifying number in the Number Indicator beside the circuit beaker (these may not be in sequential order).
9. Switch On the test equipment or connected load to verify proper operation.
10. If any MPX BRMs are Receptacle Management versions, the lights beside the receptacles should be lit.

5.0 OPERATION AND CONFIGURATION

A Liebert MPX can be operated with or without the optional Liebert RPC (rack PDU card). The card employs a Web-based interface to enhance monitoring and control, enabling users to manage rack equipment locally or from a remote location. The Liebert RPC can be used to determine power usage, switch receptacles on some units On and Off and troubleshoot input power supply problems.

The Liebert RPC will manage and monitor different types of MPX BRMs (Branch Receptacle Modules) installed on the same Liebert MPX. The feature can be valuable when some rack equipment connected to the Liebert MPX requires closer monitoring than other equipment.

The Liebert RPC supports managing and monitoring the Liebert MPX with SNMP, Liebert Nform™, Liebert SiteScan® and third-party management systems.

5.1 Configure the Liebert RPC

The Liebert RPC is factory-configured for DHCP. If you require a Static or BootP network configuration, be sure to change the Boot Mode, as described below:

1. Insert an additional Ethernet cable (not included) into the Liebert RPC's Expansion/Management port, identified by the icon on the right:

Expansion/ Management port icon

CAUTION

The Liebert RPC's Expansion/Management port should be used **ONLY** for local configuration through interconnection to a computer or for interconnecting an additional Liebert MPX or Liebert MPH.

2. Insert the other end of the Ethernet cable into a computer.
3. Configure the computer's IP settings to communicate on a 192.168.1.X network:

IP address	192.168.1.20
Subnet mask	255.255.255.0
Default gateway	192.168.1.1

4. To connect to the card, open a Web browser and enter **http://192.168.1.10** into the URL field, then press Enter.
5. Once the Rack PDU Web page is displayed, click the **Configure** tab, then click **Network Settings** in the left pane.
6. When prompted for a user name and password, enter **Liebert** (case sensitive) for both.

   NOTE: Control and configuration capabilities are protected by a username and password combination. After entering **Liebert** for both the startup default username and password, change both for security purposes.
7. Click **OK**.
8. Click **Edit** in the right pane.
9. The default Speed/Duplex for the Ethernet port is **Auto** (automatic). To change this, choose from the Speed/Duplex drop-down list.
10. Choose the Boot Mode: **DHCP**, **Static** or **BootP**. (The default is **DHCP**.)
11. Click **Save** to save any changes (or Reset to cancel). A Notice window displays a reminder to reinitialize the card.
12. Click **OK**.
13. Make other changes as needed in the **Configuration** tab.
14. To complete the configuration, click **Reinitialize** in the left pane. A **Reinitialize** button appears in the right side of the window.
15. Click **Reinitialize** in the right pane to commit the changes and reboot the card. The card is now fully operational.

5.1.1 Indicators

One or more Phase Power Indicators on the MPX PEM (Power Entry Module) should be green and lit but not flashing to indicate that input power is present and within tolerance. If input power is 3-phase, all three Phase Power Indicators should be lit green; and if input power is single-phase, one Phase Power Indicator should be lit green

Each MPX BRM should display a non-repeated identifying number in the LED beside the circuit beaker.

If any MPX BRMs are receptacle management versions, the LEDs beside the receptacles should be lit.

5.2 Operation With the Liebert RPC

Instructions for operating a Liebert MPX equipped with a Liebert RPC (rack PDU card) are more fully detailed in the card's user manual, SL-20825, available at the Liebert Web site: **www.liebert.com**

5.2.1 Connect to the Liebert RPC

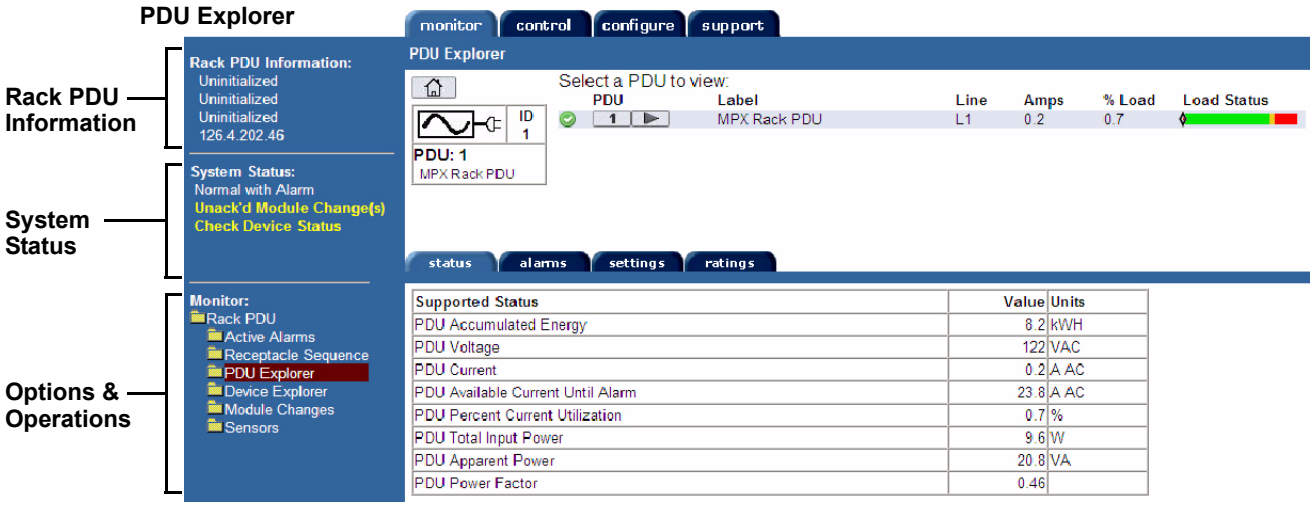
After the Liebert RPC (rack PDU card) is installed and configured, the card is ready to be used to monitor and manage the Liebert MPX as described below. If the card is not installed and configured, refer to **3.2.4 - Install an Optional Liebert RPC in the MPX PEM** and **5.1 - Configure the Liebert RPC**.

1. Open a Web browser (Liebert recommends using Microsoft's Internet Explorer®) and enter **http://192.168.1.10** into the URL field, then press Enter to display the Liebert MPX's Web page.
2. When prompted for a user name and password, enter **Liebert** (case sensitive) for both.
   Control and configuration capabilities are protected by a username and password combination. After entering **Liebert** for both the startup default username and password, change both for security purposes (refer to the user manual, SL-20825).
3. Access information about the Liebert MPX or configure the Liebert MPX by clicking on the appropriate tabs and viewing choices (refer to the views in **Figure 20**).

5.2.2 Viewing PDU and Receptacle Status: PDU Explorer and Device Explorer

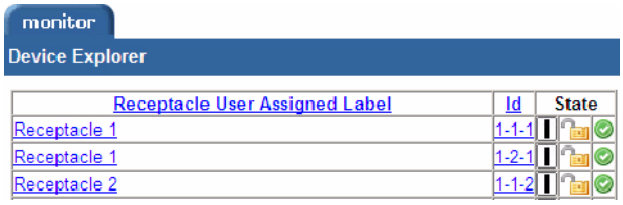
The PDU Explorer permits browsing components from the highest level of the Liebert MPX to the receptacle level. The PDU Explorer is Web-based software that displays a hierarchical view of the system. Using PDU Explorer, the user is able to browse components starting at the PDU level, through to the branches of the PDU, and down to the receptacles of those branches.

Figure 19 Liebert RPC PDU Explorer view



The Device Explorer shows the status and identification of all receptacles on a single PDU. This list can be sorted by the supplied fields, allowing quick navigation. Associated links navigate to the PDU Explorer for viewing or configuring a receptacle

Figure 20 Liebert RPC Device Explorer view



5.3 Operation Without the Liebert RPC

The Liebert MPX can be operated without the optional Liebert RPC (rack PDU card) but with reduced functionality.

After the unit is installed and assembled, connect rack equipment to the receptacles, connect input power and by switch on the circuit breaker on each MPX BRM (Branch Receptacle Module). Startup the rack equipment according to the manufacturer's instructions.

6.0 SPECIFICATIONS

6.1 MPX PRC—Model Number Configuration

- Prefix: MPXPRC-
- Mounting: V = Vertical
- Length: 1035 = Short (40-3/4"; 1035mm); 1880 = Standard (74"; 1880mm)

Table 1 MPX PRC (Power Rail Chassis) specifications

Model #	Length, mm (in.)	Maximum Modules		Maximum Rated Amperage	Rated Voltage L-L/ L-N	Unit Weight lb (kg)	Application Region
		BRM (266mm)	PEM				
MPXPRC-V1880xxx	1880 (74.07)	6	1 (220 mm)	63	230/400 VAC	4.76 (2.16)	All
			1 (266 mm)				
MPXPRC-V1035xxx	1035 (40.78)	3	1 (220 mm)				

6.2 MPX PEM—Model Number Configuration

- **Prefix**: MPXPEM-
- **Region**: North America = N; European = E
- **Type**: V = Variable-Capacity; H = Fixed-Capacity
- **Size**: A = Short (220mm), Variable-Capacity; B = Standard (266mm), Fixed-Capacity
- **Communications**: X = RPC Slot (RPC not installed)
- **Input Power**:
  - **Variable-Capacity**
    Available-Capacity: Amps; XA = 30A (24A) (NA) & 32A (EU)
  - **Fixed-Capacity**
    Plug Type: XV = 50A (CS8365C-3-Phase 3-Wire); XW = 60A (IEC309 3P4W+PE 9 o'clock blue wire), XX = 60A (48A) IEC309 3P3W+PE 9-o'clock blue wire; XZ = (European) 63A (IEC309 3P4W+PE 6 o'clock red wire; 3P4W+PE)
- **Cord Length**:
  - **Variable-Capacity**: XX = No integrated cord (requires MPX IPC)
  - **Fixed-Capacity**: Length in meters, two digits (e.g. 30 = 3.0 meters)

Table 2 MPX PEM (Power Entry Module) specifications

Model Number	Capacity	Maximum Ratings (V, I, Hz)	Input (Single/Three-Phase)	Length, mm	Application Region
MPXPEM-NVAXXAXX	Variable [1]	120/ 208 - 240 VAC, 30A (24A), 60Hz	Either	220	North America
MPXPEM-NHBXXW30	Fixed	120/208-240 VAC, 60A (48A), 60Hz	3-Phase	266	North America
MPXPEM-NHBXXX30	Fixed	250 VAC, 60A (48A), 60Hz	3-Phase	266	North America
MPXPEM-NHBXXV30	Fixed	208-240 VAC, 50A (40A), 60Hz	3-Phase	266	North America
MPXPEM-EVAXXAXX	Variable [1]	230/400 VAC, MAX 32A, 50Hz	Either	220	European
MPXPEM-EHBXXZ30	Fixed	230/400 VAC, MAX 63A, 50Hz	3-Phase	266	European

1. Requires MPX IPC; refer to **Table 4**

6.3 MPX BRM—Model Number Configuration

- **Prefix**: MPXBRM-
- **Region**: North America = N; European = E
- **Type**: B = Branch Monitoring; R = Receptacle Management
- **Size and OL Protection**:
  - **Size**: B = Standard (266mm)
  - **OL Protection**: A = 120V, 20amp; C = 230V, 20A; D = 208-240V, 20A
- **Output Power**:
  - **Number of Receptacles**: 3, 4 or 6 (per availability)
  - **Receptacle Type**: A = 5-20R; N = IEC-C13; O = IEC-C19; P = Schuko (CEE 7/4)

Phase Configuration: 1N = L1-N; 2N = L2-N; 3N = L3-N; 12 = L1-L2; 23 = L2-L3; 31 = L3-L1

Table 3 MPX BRM (Branch Receptacle Module) specifications

Model Number	Receptacle Type	# of Outlets	Outlet Rating, V/A	Max Rating, V	Overcurrent Rating, A	Voltage Configuration	Length mm	Unit Weight lb (kg)
RECEPTACLE MANAGEMENT MODULES								
North American Applications								
MPXBRM-NRBA6A1N	NEMA 5-20R	6	120/16	125	20	L1-N	266	2.5 (1.13)
MPXBRM-NRBA6A2N	NEMA 5-20R	6	120/16	125	20	L2-N	266	2.5 (1.13)
MPXBRM-NRBA6A3N	NEMA 5-20R	6	120/16	125	20	L3-N	266	2.5 (1.13)
MPXBRM-NRBD4O12	IEC C19 Sheet J	4	208-240/16	250	20	L1-L2	266	2.5 (1.13)
MPXBRM-NRBD4O23	IEC C19 Sheet J	4	208-240/16	250	20	L2-L3	266	2.5 (1.13)
MPXBRM-NRBD4O31	IEC C19 Sheet J	4	208-240/16	250	20	L3-L1	266	2.5 (1.13)
MPXBRM-NRBD6N12	IEC C13 Sheet F	6	208-240/12	250	20	L1-L2	266	2.5 (1.13)
MPXBRM-NRBD6N23	IEC C13 Sheet F	6	208-240/12	250	20	L2-L3	266	2.5 (1.13)
MPXBRM-NRBD6N31	IEC C13 Sheet F	6	208-240/12	250	20	L3-L1	266	2.5 (1.13)
European Applications								
MPXBRM-ERBC3P1N	Schuko CEE 7/4	3	230/16	250	20	L1-N	266	2.5 (1.13)
MPXBRM-ERBC3P2N	Schuko CEE 7/4	3	230/16	250	20	L2-N	266	2.5 (1.13)
MPXBRM-ERBC3P3N	Schuko CEE 7/4	3	230/16	250	20	L3-N	266	2.5 (1.13)
MPXBRM-ERBC4O1N	IEC C19 Sheet J	4	230/16	250	20	L1-N	266	2.5 (1.13)
MPXBRM-ERBC4O2N	IEC C19 Sheet J	4	230/16	250	20	L2-N	266	2.5 (1.13)
MPXBRM-ERBC4O3N	IEC C19 Sheet J	4	230/16	250	20	L3-N	266	2.5 (1.13)
MPXBRM-ERBC6N1N	IEC C13 Sheet F	6	230/10	250	20	L1-N	266	2.5 (1.13)
MPXBRM-ERBC6N2N	IEC C13 Sheet F	6	230/10	250	20	L2-N	266	2.5 (1.13)
MPXBRM-ERBC6N3N	IEC C13 Sheet F	6	230/10	250	20	L3-N	266	2.5 (1.13)
BRANCH MONITORING MODULES								
North American Applications								
MPXBRM-NBBA6A1N	NEMA 520R	6	120/16	125	20	L1-N	266	2.3 (1.03)
MPXBRM-NBBA6A2N	NEMA 520R	6	120/16	125	20	L2-N	266	2.3 (1.03)
MPXBRM-NBBA6A3N	NEMA 520R	6	120/16	125	20	L3-N	266	2.3 (1.03)
MPXBRM-NBBD4O12	IEC C19 Sheet J	4	208-240/16	250	20	L1-L2	266	2.3 (1.03)
MPXBRM-NBBD4O23	IEC C19 Sheet J	4	208-240/16	250	20	L2-L3	266	2.3 (1.03)
MPXBRM-NBBD4O31	IEC C19 Sheet J	4	208-240/16	250	20	L3-L1	266	2.3 (1.03)
MPXBRM-NBBD6N12	IEC C13 Sheet F	6	208-240/12	250	20	L1-L2	266	2.3 (1.03)
MPXBRM-NBBD6N23	IEC C13 Sheet F	6	208-240/12	250	20	L2-L3	266	2.3 (1.03)
MPXBRM-NBBD6N31	IEC C13 Sheet F	6	208-240/12	250	20	L3-L1	266	2.3 (1.03)

Table 3 MPX BRM (Branch Receptacle Module) specifications (continued)

Model Number	Receptacle Type	# of Outlets	Outlet Rating, V/A	Max Rating, V	Overcurrent Rating, A	Voltage Configuration	Length mm	Unit Weight lb (kg)
European Applications								
MPXBRM-EBBC3P1N	Schuko CEE 7/4	3	230/16	250	20	L1-N	266	2.3 (1.03)
MPXBRM-EBBC3P2N	Schuko CEE 7/4	3	230/16	250	20	L2-N	266	2.3 (1.03)
MPXBRM-EBBC3P3N	Schuko CEE 7/4	3	230/16	250	20	L3-N	266	2.3 (1.03)
MPXBRM-EBBC4O1N	IEC C19 Sheet J	4	230/16	250	20	L1-N	266	2.3 (1.03)
MPXBRM-EBBC4O2N	IEC C19 Sheet J	4	230/16	250	20	L2-N	266	2.3 (1.03)
MPXBRM-EBBC4O3N	IEC C19 Sheet J	4	230/16	250	20	L3-N	266	2.3 (1.03)
MPXBRM-EBBC6N1N	IEC C13 Sheet F	6	230/10	250	20	L1-N	266	2.3 (1.03)
MPXBRM-EBBC6N2N	IEC C13 Sheet F	6	230/10	250	20	L2-N	266	2.3 (1.03)
MPXBRM-EBBC6N3N	IEC C13 Sheet F	6	230/10	250	20	L3-N	266	2.3 (1.03)

6.4 MPX IPC—Model Number Configuration

- **Prefix**: MPXIPC-
- **Region**: North America = N; European = E
- **Input Power and Connection**:
  - **Plug Type**: XB = 5-20P, XC = L5-20P, XD = L5-30P; XE = L6-20P, XF = L6-30P; XG = L21-20P, XH = L21-30P; XO = IEC-C20; XQ = IEC309 3W 32A, XR = IEC309 5W 32A
- **Cord Length**: Length in meters, two digits (e.g. 30 = 3.0 meters)

Table 4 MPX IPC (Input Power Cord) specifications

Model Number	Capacity, A	Input Plug Type	Rating, V	Length, ft (m)
120 VAC - Single-Phase Input / Output - North American Applications				
MPXIPC-NXD30XXX	30	NEMA L5-30P Locking	120	10 (3.0)
208 VAC - Single-Phase Input / Output - North American Applications				
MPXIPC-NXF30XXX	30	NEMA L6-30P Locking	208-240	10 (3.0)
208 VAC - Three-Phase Input / 120/208VAC Single Phase Output - North American Applications				
MPXIPC-NXG30XXX	20	NEMA L21-20P Locking	208-240	10 (3.0)
MPXIPC-NXH30XXX	30	NEMA L21-30P Locking	208-240	10 (3.0)
208 VAC - Three-Phase Input / 208VAC Output - North American Applications				
MPXIPC-NXI30XXX	20	NEMA L15-20P Locking	208-240	10 (3.0)
MPXIPC-NXJ30XXX	30	NEMA L15-30P Locking	208-240	10 (3.0)
400 VAC - Three Phase Input / 200 VAC Single-Phase Output - European Applications				
MPXIPC-EXQ30XXX	32	IEC309 3W	400	10 (3.0)
MPXIPC-EXR30XXX	32	IEC309 5W	400	10 (3.0)

* These models of the MPX IPC are to be used only with Variable-Capacity models of the MPX PEM.

6.5 Agency Approvals

120V and 208V Single-Phase and Three-Phase Units

- UL 60950-1 Information Technology Equipment
- CAN/CSA-C22.2 No. 60950-1-03 Information Technology Equipment
- FCC, Title 47, Part 15 Subpart B for Class B operation as defined by ANSI Standard C63.4.
- ISTA Procedure 1A and 2A
- ROHS Compliant

230V and 400V Three-Phase Units

- CE Markings Directive 93/68EEC according to the Low-Voltage Directive (LVD)
- CE Markings Directive 73/23/EEC
- Electromagnetic Compatibility (EMC) Directive 89/336/EEC
- European Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment
- IEC 61709
- ISTA Procedure 1 A and 2A
- ROHS and WEEE Compliant

6.6 Product Warranty Registration

To register for warranty protection, visit the **Service and Support** section of the Liebert Web site at:

www.liebert.com

Click on **Product Registration** and fill out the form.

For warranty registration in Europe, the Middle East and Africa, contact technical support at:

00 80011554499 (toll free number)
+39 0298250222 (toll number based in Italy)

7.0 DIMENSIONAL DRAWINGS

Figure 21 Liebert MPX assembly dimensions, 1880mm (74") versions

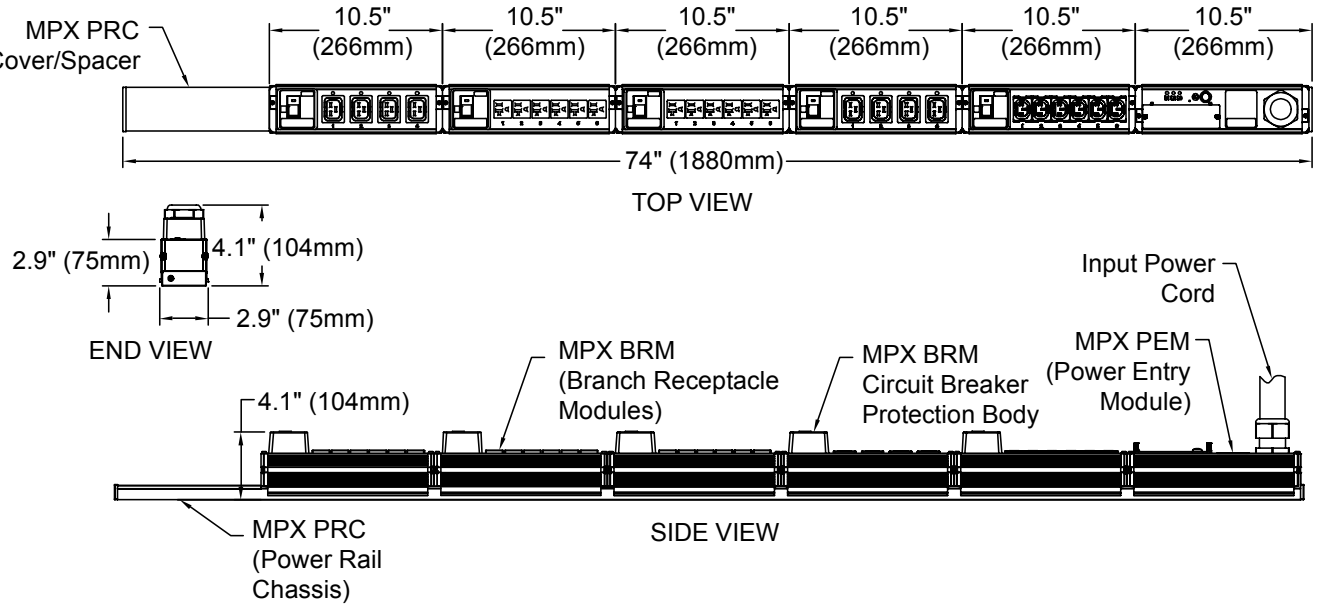


Figure 22 Liebert MPX assembly dimensions, 1035mm (40.6") versions

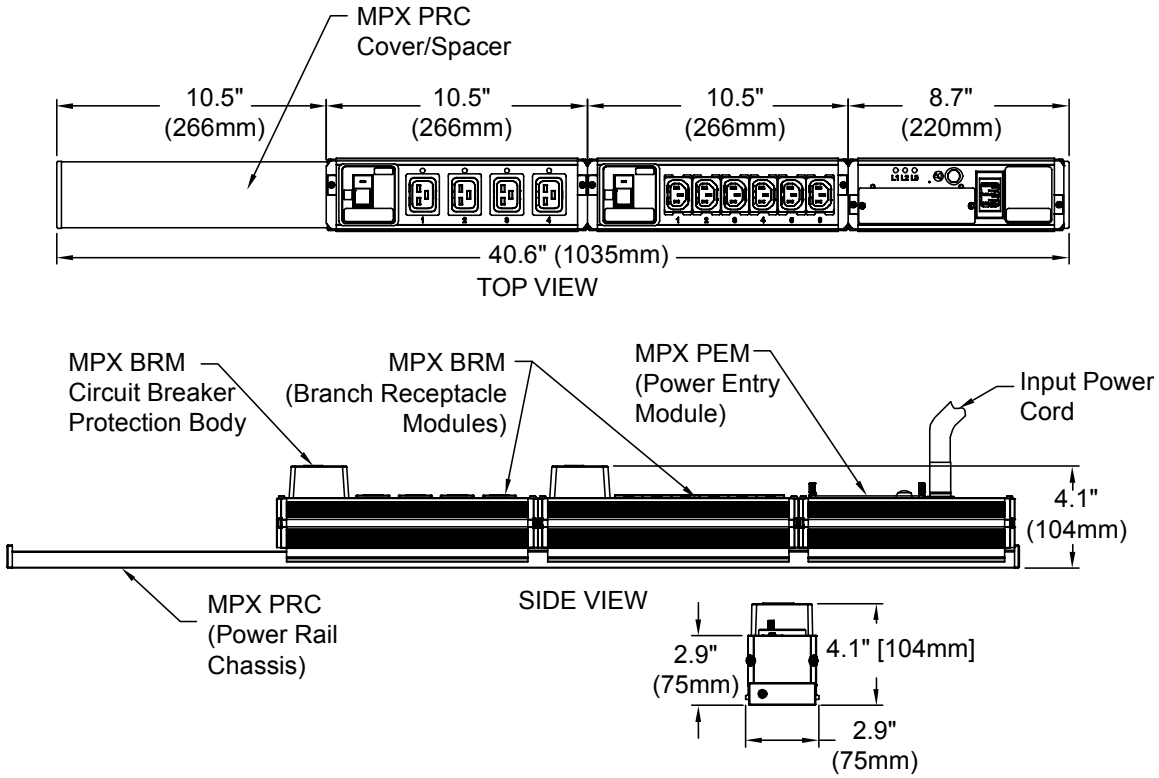
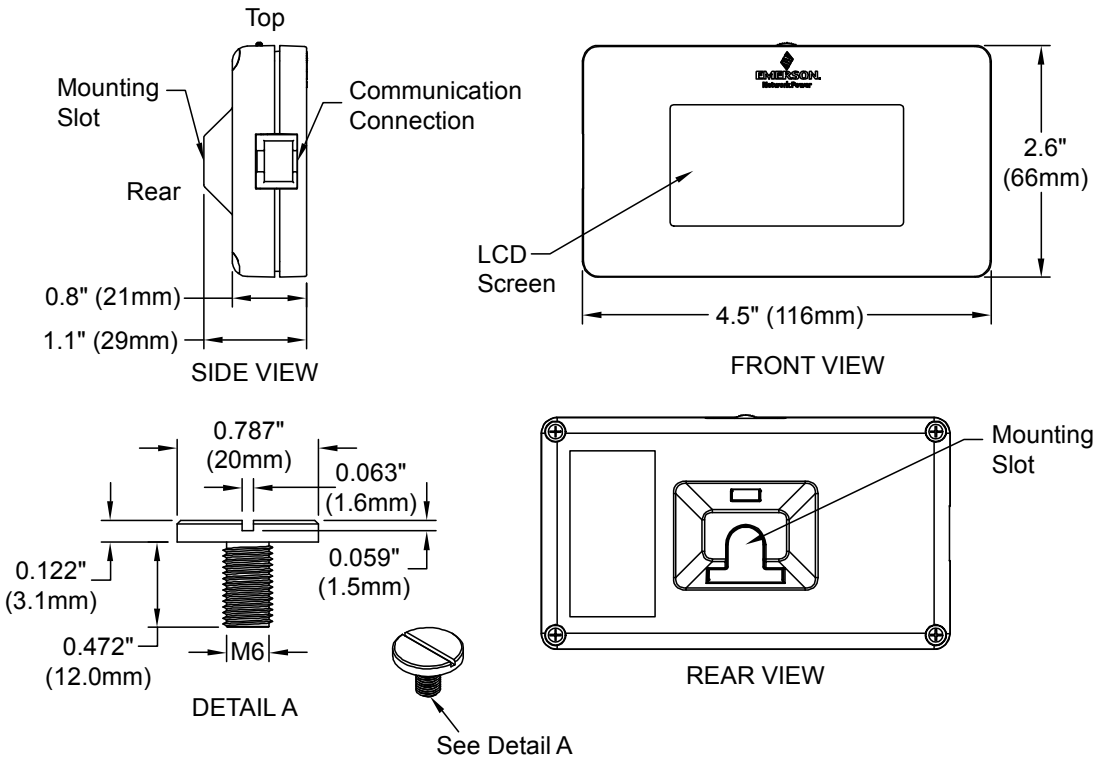


Figure 23 RPCBDM dimensions



NOTES

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